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PATENT  
Atty. Docket No.: INK-067  
(2108/56)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPELLANTS: Wilcox *et al.* CONFIRMATION NO.: 7307  
SERIAL NO.: 09/464,264 GROUP NO.: 2623  
FILED: December 17, 1999 EXAMINER: Miller, Martin E.  
TITLE: Electronic Ink Display Media for Security and Authentication

**BRIEF ON APPEAL**

Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
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Sir:

This is an appeal from the rejection of claims 1-46 in a final Office action dated June 3, 2003. A Notice of Appeal was filed on September 2, 2003, pursuant to 37 C.F.R. § 1.191(a).

The above-identified Notice of Appeal, judging from stamps on the returned receipt postcard, was received by the Patent Office on September 4, 2003. Accordingly, an extension of time up to and including January 4, 2004, for filing an Appeal Brief under 37 C.F.R. § 1.192, is respectfully requested. A petition for the extension of time and the appropriate fee are being submitted concurrently with this brief. Also submitted here is an Appendix presenting the claims on appeal, Exhibit A presenting evidence of the real party in interest, and Exhibit B presenting evidence of dictionary definition of "marker." The Appeal Brief, Appendix, and Exhibits A and B are submitted in triplicate in accordance with 37 C.F.R. § 1.192(a).

**(1) Real party in interest**

The real party in interest in the above-identified patent application is E Ink Corporation. An Assignment perfecting E Ink Corporation's interest in this application was recorded by the U.S. Patent and Trademark Office on June 8, 2000, at Reel/Frame 010908/0019. Copies of a Notice of Recordation of Assignment Document, a PTO-stamped Recordation Form Cover Sheet, and the Assignment, are attached as Exhibit A.

**(2) Related appeals and interferences**

To the best of the Appellant's knowledge, there are no related appeals or interferences.

**(3) Status of claims**

The application on appeal was initially filed with claims 1-46. Claims 1, 25, 26, and 43-45 were amended through an Amendment and Response filed on March 20, 2003. Claims 1-46 remain pending and are on appeal. The claims on appeal appear in the Appendix attached to this brief.

**(4) Status of Amendments**

No amendments were filed subsequent to the final Office action from the Patent Office dated June 3, 2003 ("the final Office action").

**(5) Summary of invention**

As defined by claims 1-25 and 43 on appeal, Appellant's invention relates to an authentication marker and a method for manufacturing an object with the marker. The authentication marker (1) is associated with the object and includes an electrophoretic display medium (4) having two surfaces (3, and 3') and multiple electrophoretic particles between the two surfaces. See, e.g., Application, page 14, lines 12-25; page 16, lines 5-28, page 18, lines 12-16; and FIGS. 1A-1C. The display medium further includes an electrode (2, 2', 6) adjacent one of the display surfaces. Id. The display state of the display medium (102) changes as a result of movement by the electrophoretic particles in response to an electric field applied through the electrode to the display medium. Id., at pages 19 and 20; and FIGS. 3A-3C. In one embodiment, the display state changes to reveal text or image (105) obscured by the display medium (102). Id. Examples of the object (201) associated with the authentication marker includes currency, stock certificates, debit cards, credit cards, and smart cards. Id., at page 8, lines 13-15; and FIGS. 6A-6C.

As defined by claims 26-42 and 44-46 on appeal, Appellant's invention also relates to a secure document (1000, 1200, 1300) that utilizes the authentication marker described above for

security purpose and method for manufacturing the document. See, e.g., Application, pages 30-35; and FIGS. 10A-12B.

**(6) Issues**

1. The first issue presented for appeal is whether appealed claims 1, 2, 6-13, 16-20, 23-25, and 43 are patentable under 35 U.S.C. § 103(a) over U.S. Patent No. 4,126,854 to Sheridan (hereinafter referred to as "Sheridon") in view of U.S. Patent No. 5,623,552 to Lane (hereinafter referred to as "Lane").

2. The second issue presented for appeal is whether appealed claims 3-5, 14, 15, 21, and 22 are patentable under 35 U.S.C. § 103(a) over Sheridan in view of Lane and further in view of U.S. Patent No. 3,668,106 to Ota (hereinafter referred to as "Ota").

3. The third issue presented for appeal is whether appealed claims 26-28, 30-41, and 44-46 are patentable under 35 U.S.C. § 103(a) over Ota in view of Lane.

4. The fourth issue presented for appeal is whether appealed claims 29 and 42 are patentable under 35 U.S.C. § 103(a) over Ota in view of Lane, and further in view of Sheridan.

5. Although Appellants believe that the above-identified issue corresponds to all of the pending rejections, Appellants also appeal any other bases for rejection of the pending claims which were not explicitly stated in the final Office action but which may be regarded as still pending.

**(7) Grouping of claims**

Claims 1-46 on appeal do not stand or fall together.

- Claims 1-25, and 43 stand or fall together.
- Claims 26-42, and 44-46 stand or fall together.

Claims 1-25, and 43 are directed to an authentication marker associated with an object, and a method for manufacturing the object with the marker. The authentication marker includes an electrophoretic display medium and associated electrode(s).

Claims 26-42, and 44-46 are directed to a secure document having a message on a surface and an adjacent electrophoretic display medium. The display medium changes its display states to either obscure or reveal the message.

An authentication marker indicates the authenticity of the object associated with it. A secure document contains information that cannot be viewed except by an intended audience. These are two different applications, each with its own challenges and advantages, of the display technology the instant application is directed to. Accordingly, the two groups of claims described above should be considered separately for patentability purpose, and the claims stand or fall separately.

**(8) Appellants' Argument**

Appellants believe that the following arguments address each of the issues presented for appeal.

**1. Claims 1, 2, 6-13, 16-20, 23-25, and 43 are patentable under 35 U.S.C. § 103(a) over Sheridan in view of Lane.**

Appellants respectfully request the reversal of the final rejections, under 35 U.S.C. § 103(a), of claims 1, 2, 6-13, 16-20, 23-25, and 43. The combination of references cited by the Examiner fails to provide a *prima facie* case of obviousness with respect to the sole independent claim on appeal.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP 706.02(j).

The initial burden is on the Examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (BPAI 1985). MPEP 706.02(j).

Three independent claims are at issue under this subsection. Among them, claim 1 recites an object having an associated authentication marker comprising:

- an object having a first surface;

- an authentication marker disposed on said first surface of said object;

- said authentication marker comprising:

- an electrophoretic display medium having a display state, a first surface, a second surface, and a plurality of electrophoretic particles disposed between said first and second surfaces; and

- a first electrode disposed adjacent said first surface of said electrophoretic display;

- wherein said display state changes as a result of movement by said electrophoretic particles in response to an electric field applied through said first electrode and to said display medium.

Of the other two independent claims, claim 25 recites the authentication marker and claim 43 recites a method for authenticating the object using the authentication marker.

Specifically, Appellants submit that neither Sheridan nor Lane, either alone or in proper combination, supplies: (1) an authentication maker; or (2) the requisite motivation to combine the references or any reasonable expectation of success for the combination.

**1.1 Neither Sheridan nor Lane teaches or suggests an authentication marker.**

Sheridon describes a flat panel display where half-light, half-dark particles are individually encased in slightly larger cavities in a volume of solid material. Sheridon, col. 2, lines 22-32; col. 3, lines 46-66; and FIG. 2. The Examiner admits that Sheridan does not teach its display being an authentication marker and relies on Lane to supply the element of authentication marker. Final Office action, page 3, para. 2.

Lane describes an identification card with a fingerprint sensor. The card verifies the identity of the user if the sensed fingerprint matches with stored fingerprint information. Lane, Abstract, col. 2, lines 16-28. Lane's card does not require external equipment for identity verification. Id. at col. 2, line 10-13.

An "authentication marker" is, first of all, a marker. A marker, or mark, is defined, relevant to the instant claims, as "an affixed or impressed device, symbol, inscription, etc., serving to give information, identify, indicate origin or ownership, attest to character or comparative merit, or the like, as a trademark." WEBSTER'S NEW UNIVERSAL UNABRIDGED DICTIONARY (1996).<sup>1</sup> Accordingly, an "authentication marker," as commonly understood, is an affixed or impressed device indicating the authenticity or origin of an associated object. This common definition of "authentication marker" is well supported by the instant specification as it describes using authentication markers that are not easily replicable by digital printing or photocopying, or that require machine validation:

The advent of high-quality digital printing methods, however, has lowered the barrier for replication of authenticated documents, generating the need for more sophisticated authentication. The inclusion of a display can provide such added sophistication. (Application, page 1, lines 14-17)

The invention can provide an authentication device that is not easily noticeable or, conversely, an authentication marker that is noticeable to users, yet in which the authentication image contained therein is not easily made visible. The present invention further provides an authentication marker that is useful for machine-only authentication. (Application, page 4, lines 20-24)

The flexible, inexpensive electrophoretic display described above is useful in numerous applications. For example, these flexible displays can be incorporated into objects and serve as an authentication marker. Moreover, these flexible displays can be used in applications where paper is currently the display medium of choice. (Application, page 18, lines 12-15)

In other words, the "authentication marker" recited in instant claims is itself an indication of the authenticity or origin of the associated object (e.g., currency) no matter who is holding or using the object. In contrast, Lane's identification card verifies the identity of the *cardholder*,

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<sup>1</sup> A copy of the dictionary page with the definition for "mark" is attached at Exhibit B.

but not the authenticity of the card. If a perpetrator tampers with Lane's card and replaces originally stored fingerprint information with his own, Lane's card would still indicate that perpetrator as the authorized person even though the tampered card is no longer authentic or original itself. Therefore, Lane's identification card is not associated with an authentication marker that would indicate the authenticity or origin of the *card*. The final Office action points to the display (127) in Lane's FIG. 3 (page 3, para. 3), but that display is merely a traditional display with no additional complex function. Lane's display is a simple signifier that signals "that a card 100 has been approved for a transaction." Lane, col. 6, lines 32-36. Accordingly, Lane does not teach or suggest a device that indicates the authenticity or origin of its card, i.e., an authentication marker.

***1.2 There is no motivation or reasonable expectation of success  
in the cited references or in the art to combine Sheridan and Lane.***

The final Office action uses classic hindsight to conveniently obtain fragments of information from two separate patents and mingle them together in an attempt to anticipate the claims at issue. However, neither motivation to properly combine Sheridan and Lane, nor reasonable expectation of success in such a combination is provided as mandated by MPEP and case law cited above.

Sheridon sets out to solve problems in contrast, particle distribution, and response time in flat panel displays (Sheridon, col. 1, lines 25-39), problems not mentioned in Lane. On the other hand, Lane's technology is in the field of identity security, and does not provide any teaching or suggestion as to how an improved flat panel display can be useful in preventing identity thefts. The instant invention, in contrast, recognizes how specific traits of electrophoretic displays can be utilized and applied in object authentication, especially document authentication. For example, Appellants recognize that electrophoretic displays can be flexible, mass-produced, and set to a display state that hides a message, such that, as a marker, the display is compatible with paper-like substrate yet cannot be photocopied or otherwise replicated -- much like putting watermark on the currency. Application, pages 1-4. The lack of suggestion in the cited references as to why and how to combine certain display technology with a security device proves that Appellants have made novel and non-obvious contribution to the art by recognizing how to adopt new display technologies to meet the needs in another field.

Accordingly, at least for reasons stated in sections 1.1 and 1.2, Appellants submit that instant claims 1, 25, and 43 and their dependent claims, are patentable over Sheridan and Lane.

2. ***Claims 3-5, 14, 15, 21, and 22 are patentable  
under 35 U.S.C. § 103(a) over Sheridan in view of Lane and Ota.***

Ota describes an electrophoretic display where non-encapsulated electrophoretic powders are suspended between a pair of electrodes. Ota, col. 1, lines 48-69. Ota does not provide any application or other kind of teaching related to document authentication. Therefore, Ota does not cure the deficiencies in the attempted combination of Sheridan and Lane with respect to claim 1. Specifically, Ota does not teach or suggest an authentication marker, the motivation to combine the cited references, or the reasonable expectation of success were the references combined.

Accordingly, Appellants submit that instant claims 3-5, 14, 15, 21, and 22, all dependent from claim 1, are patentable over Sheridan, Lane and Ota, and Appellants respectfully request the reversal of the final rejections over these claims.

3. ***Claims 26-28, 30-41, and 44-46 are patentable  
under 35 U.S.C. § 103(a) over Ota in view of Lane.***

Five independent claims are at issue under this subsection. Of the independent claims, claims 26 and 30 are each directed to a secure document while claims 44-46 are each directed to a method for securing either a substrate or a document. Claim 26, for example, recites a secure document comprising:

a conductive substrate having a surface and having a message disposed on said surface; and

an electrophoretic display medium comprising a plurality of electrophoretic particles, said display medium having a first display state and a second display state and being disposed adjacent said conductive substrate;

wherein said first display state changes to reveal said message as a result of movement by said electrophoretic particles in response to a first electrical signal communicated to said conductive substrate, and said second display state changes to obscure said message in response to a second electrical signal communicated to said conductive substrate.



In other words, the display medium recited in claim 26 exhibits a “shutter effect” such that a preexisting message on the document can be either obscured or revealed by the same electrophoretic display medium. E.g., Application, page 14, lines 26-29; page 20, line 4-page 21, line 3; page 22, lines 17-26; FIGS. 3B, and 3C.

In an attempt to anticipate claim 26, the final Office action resorts to Lane for supplying the recited element of a secure document having a display and to Ota for supplying recited elements of the display medium. Final Office action, page 7, para. 9-page 8, para. 3. However, Appellants respectfully submit that Lane does not teach or suggest the message-carrying substrate of the secure document as recited in claim 26. Appellants further submit that both Lane and Ota teach away from combining with each other.

Instant claim 26 is directed to a secure document having a conductive substrate that has a confidential message, such as medical records, disposed on a surface of the substrate. That message is the information that a display medium of the document guards against unintended revelation. See, Application, page 2, lines 19-26. In contrast, while Lane describes an identification card with a display, the display does not reveal a preexisting confidential information, but only as a signifier that a verification device for the identification card has either successfully stored certain fingerprint information or a sensed fingerprint matches the stored information. Lane, col. 2, lines 36-42. In fact, Lane states that such a display can be replaced with any other simple device that emits a signal, such as a green light emitting diode (LED) or an audio generator connected to a speaker. See, Lane, col. 3, lines 54-57; and col. 5, lines 49-60.

Moreover, Lane teaches away from replacing its simple signal emitter with a more complex display described in Ota. In its title, Lane calls its device “self-authenticating” identification card and states the goal of its invention as simplifying existing identification card by getting rid of any equipment in addition to the card itself. Lane, col. 1, line 65-col. 2, line 13. An electrophoretic display described in Ota needs means to address the display and connection to a source of electricity. This will not only add separate equipment, but also drives up the cost. Besides, Lane’s card is an identification card and does not store confidential information that can be easily copied. Therefore, there is no reason to incorporate Ota’s display into Lane.

Neither does Ota provide any motivation to combine the two references. In fact, Ota teaches away from such combination as well. The display medium of Ota is typically housed between two “opposite major housing walls,” such as glass plates and metal plates, that lack the flexibility needed to be incorporated as an integral part of a document. See, Ota, col. 9, lines 31-39; and col. 11, lines 30-33. Compared to the instant application, the electrophoretic materials in Ota are not encapsulated but simply suspended in a suspending medium in particle forms. Ota, col. 8, lines 21-52. The electrophoretic particles in the instant invention are encapsulated in microcapsules that enable the “significant bending of the display substrate without permanent deformation or rupture of the capsules themselves.” Application, page 17, lines 1-9. The microcapsules make it possible for incorporating electrophoretic displays into flexible substrates such as paper or plastic. See, Application, page 4, lines 7-14.

Same deficiencies in Lane and Ota exist for claims 30 and 44-46. Accordingly, claims 26, 30, 44-46 and their dependent claims, are patentable over Ota and Lane, and Appellants respectfully request the reversal of the final rejections over these claims.

**4. Claims 29 and 42 are patentable under 35 U.S.C. § 103(a) over Ota in view of Lane and Sheridan.**

Claim 29 depends from claim 26; claim 42 depends from claim 30. Both claims 26 and 30 have been discussed in subsection 3 with respect to Ota and Lane. Sheridan, discussed in subsection 1, does not cure the deficiencies of Ota and Lane stated in subsection 3, i.e., lack of teaching of the message-carrying substrate of a secure document, and the lack of motivation to incorporate a complex display in Lane’s *self-authenticating* identification card.

Moreover, Sheridan does not provide any teaching that can be used to modify Ota’s display such that the display would anticipate claim 29 or 42. Specifically, the final Office action’s characterization of Sheridan as teaching microencapsulation of electrophoretic particles is misplaced. First of all, Sheridan does not teach electrophoretic particles. Electrophoretic particles such as those in Ota rely on translational movements in a suspension fluid for achieving the desired optical effect. Ota, col. 5, lines 1-11. In contrast, Sheridan’s display consists of a volume of solid transparent material where twisting balls rotate within slightly larger cavities “without translational freedom”. Sheridon, col. 3, lines 35-46. Second, Sheridan’s reference to

“encapsulation” is in the context of forming a cavity boundary for each twist ball, and does not teach microencapsulation of electrophoretic particles. See, Sheridan, col. 4, lines 59-67.

Sheridon and Ota differ so much in their respective mode of operation that incorporating Sheridan into Ota would only make the resulting display farther from what is recited by instant claims 26 and 30. Sheridan’s twisting balls are coated half in black and half in white (Sheridon, col. 3, lines 47-66; and FIG. 2). Because these twisting balls are confined in pre-assigned cavities, Sheridan’s display is not capable of achieving a light transmissive state to reveal an underlying message. In other words, the shutter effect required by the displays recited in instant claims 26 and 30 cannot be achieved by Sheridan’s display.

Accordingly, claims 29 and 42, dependent from claims 26 and 30 respectively, are patentable over Ota, Lane, and Sheridan, and Appellants respectfully request the reversal of the final rejections over these claims.

**5. The claimed invention is patentable under any other possible bases for rejection.**

Appellants believe that the foregoing arguments address each of the pending rejections of the pending claims. In particular, the present Brief addresses each of the rejections made final in the Last Office Action. Accordingly, Appellants submit that the present application meets all requirements for patentability.

**Conclusion**

For the reasons given above, it is respectfully requested the rejections in the final Office Action be reversed and the application be passed to issue with claims 1-46 as presented in the Appendix A.

A Transmittal and Fee for the filing of this Brief on Appeal, as well as a Petition and Fee for a two-month extension of time are submitted herewith. Appellants believe that no other fees are necessitated by the present filing. However, if any additional fees are due, the Commissioner is

Appellant: Wilcox *et al.*  
Serial No.: 09/464,264  
Filing Date: December 17, 1999  
Page 12

hereby authorized to charge any such fees to Attorney's Deposit Account No. 20-0531.

Respectfully submitted,



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